#3
PROPERTY OF
THE NATIONAL ASSOCIATION OF COST ACCOUNTANTS

N. A. C. A. BULLETIN

Vol. XVIII, No. 13 March 1, 1937

IN TWO SECTIONS

Section I

N.Y.U. LIBRARY

IN THIS ISSUE

Problems of Present-Day Inventory Valuation, by Maurice E. Peloubet 741

Current Practices in Inventory Valuation, by E. W. Graham 752

This Bulletin is published semi-monthly by the National Association of Cost Accountants, 385 Madison Avenue, New York. Subscription price, $10.00 per year. Entered at the Post Office, New York, N. Y., as second-class matter August 28, 1925, under the Act of March 3, 1879.

EDITORIAL DEPARTMENT NOTE

Very likely the prices of raw materials in your industry increased during 1936. There is a possibility of further increase during 1937. In the light of these advances have you considered the effect that your present method of inventory valuation is having on the determination of profits, and the relation of reported profits to realized profits? Do you realize that during a period of rising prices the use of the "generally accepted" methods of inventory valuation tends to result in a reported profit in excess of the profit actually realized and available for dividends, and realize what this means under the current tax laws? Very likely your answers to these questions will be in the affirmative. Even so, it will be worth your while to read the two articles in this issue of the Bulletin where this problem is discussed and alternative methods of inventory valuation presented.

The first article is by Maurice E. Peloubet who first presented this problem of inventory valuation methods to our members at the Cincinnati Convention last June. Mr. Peloubet entered the public accounting field in 1911 with Price, Waterhouse & Co. and in 1914 was transferred to the London office of the firm. Returning to the United States in 1919, he became associated with Pogson, Peloubet & Co., and since 1921 has been a member of that firm. Mr. Peloubet is a C. P. A. of New Jersey and New York and a member of the American Institute of Accountants, the National Association of Cost Accountants, and the state C. P. A. Societies of New York and New Jersey.

The author of our second article, E. W. Graham, also had wide experience as a public accountant. Following his schooling at Pennsylvania State College and the Wharton School of Commerce and Finance at the University of Pennsylvania, Mr. Graham spent eleven years as a member of the staff of Price, Waterhouse & Co. He left public accounting to enter the employ of the Gulf Oil Co. of Pittsburgh, where he is now Assistant to the Controller. He is a member of the Pennsylvania Institute of C. P. A.'s and the American Institute of Accountants.

COPYRIGHTED BY THE

NATIONAL ASSOCIATION OF
COST ACCOUNTANTS

MARCH 1, 1937

PROBLEMS OF PRESENT-DAY INVENTORY VALUATION

By Maurice E. Peloubet, Partner,
Pogson, Peloubet & Co., New York, N. Y.

THE CORRECT application of appropriate inventory methods to the accounts of an enterprise is so important at the present time that the necessity for careful thought and prompt action can hardly be overestimated. This statement is true, but I am afraid that some of my friends will say "He has been telling us that for ten years or so and the disaster still seems to be imperceptible or indefinitely postponed." The disasters have not happened yet, it is true, but I am afraid they are not far off for some enterprises. We have often been told that we live in a changed world. Nowhere is this more true than in the relation of business to Government and to other bodies of a quasi-public nature, such as the securities exchanges. Accounting statements generally form the connecting link between Government departments and business, and frequently form the basis for regulation and control.

"Circumstances Alter Cases"

A silk hat considered as a thing by itself is neither good nor bad, nor right nor wrong. It is, however, appropriate for a wedding or for the opera, and highly inappropriate for a game of golf or a bath in the surf. However, in a country still allowing a modicum of personal liberty to its inhabitants, the worst result of such an amiable eccentricity as swimming in a silk hat would be the smiles and, possibly, jeers of friends and passersby, and while the wearer of the inappropriate headgear might be advised to be a little less unconventional, there would probably be no really serious consequences.

Suppose, however, the free and democratic country where a man could wear a silk hat to swim in came under the rule of a dictator who laid down rigid laws requiring the wearing of appropriate dress on all occasions. Suppose, also that large groups of inspectors and special sartorial police were organized to apprehend violators, and that violations were punished by fines sometimes exhausting the violator's entire supply of ready cash. Swim-

ming in a silk hat would then become, not a harmless weakness, but a matter almost of life and death through the imposition of heavy fines and punishments.

So has it been with accounting. Before the imposition of Federal taxes on income, broad accounting principles had been fairly well developed, but their detailed applications were largely discretionary. Those enterprises which were audited by public accountants published statements more consistent and revealing, perhaps, than those the accounts of which were not audited, but the statements were not very complete and were not always consistent from year to year, and while the results were substantially correct when the accounts were audited by reputable accountants, not much information was given about the accounting methods and principles employed. A tax on income, even at a small rate, puts a premium on correct accounts, particularly on a conservative income account, but the effect was not marked during the first few years of the income tax on corporations. Later, increasing rates of corporate taxes, and particularly excess profits taxes, made overstatements of income more serious, but there were various provisions in the Revenue Acts previous to 1932 that mitigated the effects of inappropriate accounting methods, the tendency of which was to attribute income to periods other than those in which it was realized. The right to carry forward losses and the various inventory provisions and allowances in the Revenue Acts and Regulations of the early '20's did much to make it possible to reconcile taxable income with realized income.

Correct Presentation Now Takes on a New Importance

The Revenue Act of 1932 did not allow losses to be carried forward, but as most corporations had no income or very little from 1932 to 1936, and if they did have some income, paid only at a flat rate of tax, the situation was still tolerable. But now we are confronted with demands and requirements that are in some cases so difficult that they make the continued existence of a business and the freedom from prosecution of its directors and managers depend very largely on the correct presentation of the accounts of the enterprise. Accountants have not shirked their new responsibilities. On the other hand, some of them have regarded their new eminence with a little misgiving.

Two bodies to which corporations must generally report are the Treasury Department and the Securities and Exchange Commission. Even if a company is not listed on any securities exchange, there is always the possibility that sooner or later it will issue securities or will in some way become involved with the Securities and Exchange Commission. In addition, there may be securities exchanges, public utility commissions, the Federal Trade Commission under the Robinson-Patman Act, the Interstate Commerce Commission, and other similar bodies which may have supervision over a corporation and to which it must furnish accounts. The Securities and Exchange Commission requires correct accounts from their point of view, which is generally about the same as the point of view of a well-qualified public accountant. This attitude is quite different from that of the Treasury Department which, to say the least, does not require conservatism in the statement of income. The requirement to disburse all taxable income in dividends or to suffer the imposition of a punitive tax is another compelling force toward correct accounts, as under such a law an incorrect accounting method may force the disbursement and dissipation of working capital required for the company's operations.

If, say in 1914, a manufacturer showed profits of $250,000, composed of $25,000 fabricating profit and $225,000 inventory write-up, the result would be wrong. The stockholders might have been misled, but the existence of the business was not endangered. In 1914 men still wore shirts with starched cuffs, and with the aid of his bank passbook and a few abstruse calculations on his left cuff, the manufacturer could prove that those figures must be wrong as he had only about $25,000 more cash at the end of the year than at the beginning. His income tax on the fictitious profit of $225,000 and on the actual profit of $25,000 was calculated at the rate of 1% and amounted to only $2,500, which left him $22,500 cash as the results of the year's business. The manufacturer might say: "The bookkeeper knows his business, the books balance, and he says we have $250,000 profit. Perhaps we have; perhaps we haven't. In any case, the stockholders only get $20,000 dividends. I need some money to run the business on and I run on cash not on book profits." The manufacturer's respect for accounting as a high and mysterious ritual may

have increased. The idea that it was one of the indispensable tools by which the management should operate a business would have appeared ludicrous to him, and I, for one, would hesitate to take issue with him under the circumstances.

Historical Costs No Longer Adequate

Those were the days of the so-called historical cost or job cost that was about as far removed from reality as possible, if by reality we mean the facts on which business is actually operated. The implicit principle behind the job or historical cost was that it was exact, it was correct, and that this cost must be covered by the sales price. In other words, the customer should pay for the mistakes and misfortunes of management and until he did so, the costs of these mistakes and misfortunes should be carried in inventories. That was the cost method of inventory under the historical basis. Periodically the results of such a method would get so bad that the costs were greater than the goods could possibly be sold for. A sort of major surgical operation designed to reduce the dropsical growth of the cost inventories under the actual or historical basis was then performed, and the inventories were reduced to cost or market, whichever was lower. While this operation substantially corrected the balance sheet, its effect on income was, of course, to reduce arbitrarily the profits of the year in which the operation was performed in an amount equalling the overstatement of profits in previous years.

We now have a number of methods which, when applied to appropriate cases, will prevent the accumulation of costs improperly in an inventory and will avoid the resulting distortion of operating results between years. While accountants have done something in the improvement of inventory methods, I am afraid it must be admitted that the greatest advances have been made by operators and engineers, and in some cases the improved methods have been unwillingly adopted by accountants. The use of standard costs in inventory valuation, one of the principal means by which the difficulties and inaccuracies of the historical cost method have been overcome, was, I believe, in general more the result of pressure from engineers and industrial accountants than from professional public accountants. The use of normal stocks, "last-in, first-out," or replacement methods, was advocated by operat-

ing men before it was accepted by the accounting profession. I am not sure about the retail method of inventorying in mercantile establishments, but I believe that here, too, it was the practical man who first used the method. Professional accountants have improved and refined the methods and made them workable, but the basic concepts of correct inventory valuation have, I think, been more the result of the thought and effort of operators and engineers than of professional accountants. I do not say this in any disparagement of professional accountants, but merely to emphasize the fact that no accountant, whether employed by Government bodies, by an industrial enterprise or practicing independently, can afford to shut himself up in an ivory tower of theory and abstraction and try to issue statements of so-called principles which do not square up with the rough and difficult facts of business life.

Recent Developments Make Errors in Accounting Theory Most Serious

One reason why accounting theory has to some extent, lagged behind the progress of business has been, I think, that up until now the results of errors were not so serious. An error in engineering theory will cause a bridge to break. An error in merchandising methods will lose sales. These are serious because they are translated into action. Up until now, errors in accounting theory have not been so serious because they have not invariably been translated into action. In many cases the instincts of managers and operators told them the accounts were wrong, even though they could not prove it, and they refrained from taking action on accounts which they felt sure did not fully reflect the facts. Now the conditions are different. The ascertaining of a book profit is practically equivalent to the payment of a dividend or the payment of a tax as a penalty for not distributing the dividend. If the company is listed on a securities exchange, the management may be personally liable for errors in the statements of account. At the present time the Government requires accounts to be correct and sets various penalties by means of the taxing and other statutes if they are not correct.

We are required to estimate profits before the close of the year, and here again must pay a substantial penalty for deviations from

a confessedly impossible standard. The increasing insistence of the Treasury Department on each taxable year as an entirely separate unit, magnifies the effect of every error in computation or estimate. The ideal of a set of accounts which attributes to each year exactly the income which was earned in that year is, of course, an unattainable one, but that does not mean that we should not attempt to approach as closely to this as possible. We cannot go swimming in silk hats any more. Now if a corporation is not dressed in the appropriate financial garments, the police and tax gatherers swoop down. The crime is not indecent exposure, as no exposure of corporate workings, however intimate, is anything but laudable. The crime consists in appearing in a public place inappropriately clothed.

The cut and fit of the financial garments is largely the accountant's responsibility. If the corporation is well turned-out and appropriately clad financially it will be well thought of by its owners, the stockholders, and by its teachers and governors, the various government departments under whose regulation it falls. Its officers and directors will escape punishment and censure and may even occasionally receive a little guarded praise.

But woe betide the unfortunate corporation which walks out with a dirty face or unpolished shoes. No matter how basically healthy it is the punishment is swift and sure. The lightest penalty is to be told to go home and get dressed over again or to receive a public spanking and a fine, while the heaviest is death by means of what the Mikado describes as "something humorous but lingering" not "with either boiling oil or melted lead" but by a slow and progressive draining away of the blood.

Methods of Inventory Valuation

Probably the most important single factor in the determination of income for most enterprises is the correct valuation of the inventory. The methods are many:

Cost on first-in, first-out basis
Cost or market, whichever is lower, or first-in, first-out basis
Standard cost
Retail method
Normal stocks

Replacement method
Last-in, first-out
Moving average
Weighted average
The identification of specific costs with specific sales
Hedging the inventory

There are other methods but these are enough to illustrate the possibilities. No one of these methods is intrinsically right or wrong. Each is merely a method suitable under certain conditions, unsuitable under others. Normal stocks would be ridiculous in a department store and the retail method would hardly work in a steel plant.

In the face of so many possibilities what is the test to determine the appropriateness of any one method to a given situation? Generally that method under which book income most closely approximates realized or realizable income is the method to be preferred, or to put it another way, the plan under which the purchases or production intended by management to apply to the sales of the period are so applied is the most suitable. No method which has the effect of arbitrarily accelerating or retarding the recording of income can be considered correct.

Three Methods Applied to Retailing

For instance a retail organization dealing in goods where style is a major factor in salability might show inventories on various bases as follows:

			Inventory difference	
	Beginning of period	*End of period*	*Increase over beginning*	*Decrease from beginning*
Cost—first-in, first-out.....	$150,000	$175,000	$25,000	.....
Cost or market—first-in, first-out	130,000	115,000	.....	$15,000
Retail method—Sales price, less mark-up percentage	100,000	95,000	.....	5,000

A rapidly falling market about inventory time is assumed. The third method is the correct one. The first method defers a loss of $30,000 to future periods, the second overstates the loss by $10,000 and the third method gives a result which applies—by taking the inventory at sales price less mark-up—the current costs to

current operations. Loss on goods going out of style is a current cost of selling style goods and the retail method provides for this.

Three Methods Applied to a Processor's Inventory

A processor's inventory is say, the equivalent of 100,000 pounds of material at the beginning of the period and 110,000 pounds at the end. Sales have been equivalent to 200,000 pounds and purchases have been, of course, 10,000 pounds more.

Prices were:

Market at beginning of period	10¢ per lb.
Market at end of period	15¢
Average for period	13¢
Cost of beginning inventory—first-in, first-out basis—average	9¢
Cost of ending inventory—first-in, first-out basis—average	14¢
Price for normal stock	7¢
Cost of beginning inventory—last-in, first-out basis	8¢

Cost of sales on various inventory bases would be:

				On basis of			
	pounds		*Cost first-in, first-out*	*Normal Stocks*		*Last-in, first-out or Replacement*	
Inventory at beginning	100,000	9¢	$ 9,000	7¢	$ 7,000	8¢	$ 8,000
Purchases	210,000	13¢	27,300	13¢	27,300	13¢	27,300
			$36,300		$34,300		$35,300
Inventory at end	110,000	14¢	$15,400				
	100,000			7¢	$ 7,000	8¢	$ 8,000
	10,000			14¢	1,400	10¢	1,000
			$15,400		$ 8,400		$ 9,000
Cost of sales			$20,900		$25,900		$26,300
Cost of sales—per lb.			10.45¢		12.95¢		13.15¢

The purchases of the year were made for the sales of the year. The inventories cannot be reduced much, if at all. The small excess may be valued at first-in, first-out as in the normal stock example or better at last-in, first-out as under that or the replacement method. The first method overvalues the inventory and inflates profits some $5,000. The $5,000 is not represented by any addition to an asset as 90% of the inventory is represented by the same quantity, irreducible so long as operations continue, of material of the same nature as was included in the beginning inventory.

Although purchases averaged 13¢ for the year the first-in, first-out method shows an average cost of 10.45¢. Either of the other

methods shows a cost closely approximating the average purchase price of the year and thus applies current costs to current sales. These, it would seem, are the correct methods and they both reflect the intention of the management, to cover sales as made rather than to apply previous costs to current sales, and they show a profit realizable in cash, the difference between current receipts and current expenditures for materials and wages.

Payment of Dividends and/or Taxes from Inventory Write-Ups Difficult

It would be difficult to pay a dividend or a tax from that part of the profit represented by a mere write-up of inventory. However, many corporations will be faced with this dilemma. Taxable income, under present regulations, may not be computed on a replacement basis and current costs, unless the items of purchases are specifically identifiable, may not be applied to current sales. It is assumed, by the use of the first-in, first-out method that current purchases or production are not made to cover current sales but are made to replace inventory and that purchases made long in advance of the sale were made to cover that sale.

Anyone who has ever had anything to do with a business which uses large quantities of a basic raw material and where the processing period is long, knows that one of the principal problems of management is to cover currently by raw material purchases the sales which are being made from day to day. The real profits of the business depend largely on the success of such covering operations. The management has constantly before it the possibility of being undercovered in a rising market or long in a falling one. Some industries, such as flour milling or cotton spinning, have this problem but they are able to solve it by "hedging" operations, which eliminate the risk of changes in raw material prices between the date of the sale contract and the date at which the inventory represented by the sale must be replaced.

Effect of Forced Dividend Distributions in Period of Rising Prices

Apparent profits made by writing up a minimum quantity of inventory are known to management to be non-existent, a delusion, and if made the basis of tax or dividend payments they would be a sure method of ruining a corporation in a few years of rising

prices. The real thing which companies which must maintain a constant stock of raw or process material have to fear is apparent prosperity and rising prices. If inventory is the major item of the current assets, say 75% of them, an increase in price of the constant inventory of 100% would mean, if all apparent profits were paid out in dividends the total extinction of the companies' working capital. For example:

	Units	*Price*	*Amount*
Normal inventory at beginning	75,000	$1	$ 75,000
Other current assets			25,000
Total current assets			$100,000
Normal inventory at end	75,000	$2	$150,000
Other current assets			100,000
			$250,000
Profits—Actual—on fabrication			$ 75,000
—On write-up of inventory			75,000
To be paid out in taxes or dividends			$150,000
Current assets available (increase in year)			75,000
To be provided by borrowing or partial liquidation			$ 75,000

The payment would require all the current assets available or $75,000 and an additional $75,000 to be provided, presumably by borrowing, as the inventory cannot be reduced except by partial liquidation and shutting down of the enterprise. The real profits, of course, are only $75,000 which could be paid out without harm to the corporation.

No bank or individual would lend money to pay a tax levied on capital unless the company agreed to liquidate. Certainly no one would lend on the express understanding that the only possibility of repayment was during a period of falling prices when apparent profits would be less or apparent losses greater than actual. By that time the company would have been driven out of business.

At present there seems little prospect of relief for enterprises with long processing periods where large fixed stocks of basic raw materials must be carried. A provision enacted now, not retroactive, for carrying forward losses would be of no value if there is a prolonged period of rising prices. In many industries a price

rise of 50% to 100% in raw material prices would mean exhaustion of working capital and liquidation or bankruptcy.

I cannot say what the outcome will be. But the lot of the small, not well-financed corporation in this type of industry will be made unbearable by apparent prosperity and the strong, well-financed corporation will be weakened but may still exist. These corporations can only hope that prices may fall before they rise so far as to ruin them. A fall means decreased business, an approach to a business recession, but these things will permit them to retain a little working capital which it would be impossible to retain under present laws and regulations.

While it has always been desirable to state a corporation's accounts correctly, it has never been so important as now. The method of stating a corporation's income has become a determining factor in its policy, and perhaps the most important single item in the income account is the inventory.

I wish to leave this thought with you. There are many inventory methods, none absolutely right, few completely wrong. Everyone responsible for the accounts of a corporation should test the method he is using, examine it critically, and try to determine whether it is the one which expresses the results of the operations of the business. If it does this, it is probably correct. If it does not do this, it is certainly wrong.

CURRENT PRACTICES IN INVENTORY VALUATION

By E. W. Graham, Assistant to the Controller,
Gulf Oil Corporation, Pittsburgh, Pa.

THE INVENTORY is one of the more important balance sheet items by reason of its effect on the net current asset ratio and because of its direct relation to the profit and loss for a given period. Preliminary to a discussion of inventory valuation it would be well to review the generally accepted principles pertaining thereto. For many years the basic rule has been valuation at "cost or market, whichever is lower." The inventory *should not be valued at more than its probable realization value,* which provides for taking into account all losses but anticipation of no profits. Slow-moving, obsolete, and unsalable stocks should be written down to a price at which no loss should result in the succeeding period. Profits should not be taken on unsold inventory stocks. The inventory *at the beginning and end of the period* should be valued *on the same basis,* although at times it may be difficult to agree upon the true meaning of the words "same basis," due to fluctuating sales prices, costs, and other factors. An inventory valuation method *should be well adapted to the industry in which* it is *used.* Undoubtedly all of you agree with these valuation principles. However, I believe we should examine them closely.

Main Purpose of Inventory Valuation

The principle of providing for all losses but anticipating no profits indicates that the main purpose of valuing an inventory is the determination of income or losses for a given, limited and artificial period. Probably the traditional use, in commercial pursuits, of the year of twelve months, was founded on the fact that our basic industry, agriculture, finds its natural fiscal period in the calendar year, by reason of the unvarying influences of the changing seasons, from planting time in the Spring to harvest time in the Autumn. Also it is true that at regular intervals rentals, taxes, interest and other recurring expenses must be met. Dividends or other profit distribution are usually declared at more or less regular intervals.

Business Cycle Generally Longer than a Year

However, even a casual review of price ranges and production statistics in most industries indicates that the business cycle extends over a longer period than a year—in some instances five or more years; from periods of low prices and curtailed production through periods of expansion, increased production and high prices and back again to periods of low prices and decreased production.

Many Interpretations of "Cost"

Let us consider briefly the meaning of the term "cost" as applied to the inventory, and the several interpretations which we find applied to it. All public accountants learn from their earliest experience that the meanings attached to the term "cost" as applied to the inventory by their several clients cover a wide range. A company may claim to value the inventory at "actual cost," which may or may not include the expense of avoidable and unnecessary waste, losses and mistakes. Full allowance may or may not be made for idle plant conditions or temporary non-operating intervals by treating such expense as "unabsorbed operating burden," separate from costs applied to the inventory. Then there is the use of standard costs in inventory valuation predetermined upon the basis of normal, attainable operating performance, cumulative average costs, so-called closely estimated costs and other variations too numerous to mention. Every one of these methods has its effect upon the income account through the cost of sales group of accounts.

Further Explanation of "Cost or Market" Needed

You undoubtedly have known for years that these many interpretations are applied to the term. Consideration of this fact, however, causes us some wonderment at the almost general acceptance without question of financial statements wherein the inventory valuation is stated as being upon the basis of cost or market, whichever is lower. To my mind, further explanation is necessary, that is, whether all individual material units comprising the inventory are below market value or whether some are valued above market but the aggregate inventory value is below market.

Inventory on hand at any given time represents an uncompleted transaction and the estimates of profit on uncompleted trans-

actions should be made on a very conservative basis. It is certain that the difference between such an estimate and the actual realized profit or loss will be reflected in succeeding periods. Of all the approximations which must be made at the close of an accounting period the most difficult and the one which has the most influence upon the accounting results is the determination of the money value of the inventory.

Use of Market Value Sometimes Misstates Income

Many times we have seen losses taken upon the basis of adjustments of inventory values to market prices below cost, and in the ensuing year or two a return of the market prices to the level from which they dropped, with resultant distortions of profits as between the two or three years. I recall in my public accounting experience the close of the year 1920 or 1921 and the price slump of that year—a minor depression—the grave concern of company officials who had seen profits made during the first part of the year washed away by large inventory adjustments at the close of the year, and I recall also that at the close of the next succeeding year the price of those same commodities had increased to almost the previous year's high level. Certainly the profit and loss results as shown upon this basis were erroneous.

Cost or Market Basis not Always Logical

Thus it is seen that valuation upon the basis of "cost or market, whichever is lower," while generally conservative, is not logical in all cases. It provides for losses on the basis of market value at inventory date which losses actually have not or may never be sustained, as the inventory may be sold in a succeeding period at more than its cost.

Speaking broadly, it is an impossible condition for market prices to remain below cost. This condition may pertain in certain isolated cases, but generally market prices of all commodities must be in advance of their cost of production, and accordingly adjustment of inventory values to market prices below cost is recognition of a temporary condition only, and to some extent might be said to be caused by hysteria.

My remarks to this point may appear to be a direct frontal attack upon the basic rule of "cost or market, whichever is lower."

That, however, is not the case, and I hasten to correct that impression if you have gained it. I agree with the principle of providing for all losses and not anticipating profits of writing down slow-moving and obsolete materials to realizable values, and of consistency of practice at the beginning and end of an accounting period and throughout the existence of a business venture. I have endeavored only to point out the principal shortcomings of the so-called basic rule of valuation, "cost or market, whichever is lower."

At times we dislike to change our minds about subjects which we have grown up with and we hesitate to rearrange our ideas of values, as we are inclined to feel that we came by our judgments logically and even judicially, although we may recognize subsequently an overbalancing factor that tends to change the entire situation.

Inadequacies of "Cost or Market" Basis Recognized

Recognizing these certain inadequacies of the principle of "cost or market, whichever is lower" and the divergencies in the application of the general principle in the petroleum industry, to a large degree due to very appreciable fluctuations in the market value of crude oil and its derivative products, the American Petroleum Institute passed the following resolution on November 12, 1934:

> "RESOLVED: That the uniform method of valuing petroleum inventories called the 'last in, first out' system, as presented by the committee on uniform methods of oil accounting is hereby accepted and recommended for adoption for the calendar year 1934 or as soon thereafter as practicable, as a method of valuing petroleum inventories, to be used in conjunction with the general form of balance-sheet and text as approved December 9, 1926, as a system for keeping books and accounts and for making the report for all those engaged in the oil industry, it being understood this uniform method of valuing petroleum inventories, as well as the balance-sheet and text, is subject to such changes and improvements from time to time as the committee may deem necessary after approval by the board of directors."

In the remainder of this discussion I shall endeavor to explain to you the basic principles of the "last in, first out" method of inventory valuation. To those who have read the "Report of the Special Committee on Inventories of the American Institute of Accountants" published in the August, 1936, issue of the *Journal of Accountancy*, it will be noted I have drawn to a

large extent upon that article in explaining this method of valuation. I refer also to the "Uniform System of Accounts for the Oil Industry—Revised to June 30, 1936," recently issued by the American Petroleum Institute.

It should be remarked that while I speak of the petroleum industry, it is only by reason of the fact that the American Petroleum Institute promulgated and recommended the "last in, first out" system of valuing inventories to its member companies, that most of the available reading matter upon this subject has been in that connection, and that I am associated with the petroleum industry. This method of valuation can be applied logically to other industries, and this brings me to the first point in the discussion of this method of valuation.

Quick Communication of Raw Material Price Changes to Products

You will recall that I mentioned at the outset that an inventory valuation method should be well adapted to the industry in which it is used. I refer to the characteristic of quick communication of price changes in raw material commodities to the derivative products. In the petroleum industry, price changes in the raw material, crude oil, exert practically a simultaneous and corresponding effect on the finished products, but such characteristic is not peculiar to the petroleum industry alone. In the base metal manufacturing trades, such as copper, pig iron, lead, spelter, and certain other industries, the same characteristic is evident. The cotton textile and grain milling industries are afforded a means of "price protection" by the futures traded in in those markets. Where price changes in the raw materials exert a corresponding influence on the derivative commodities, the margin of profit very frequently is conceived as representing the spread between current sales prices and the replacement cost of raw materials, rather than inventory costs. The difference between this concept of the profit margin and that resulting from the use of inventory costs, is, of course, more pronounced if the raw materials experience frequent and relatively substantial price fluctuations, as in the case of the petroleum industry. Thus while over a long period, such as a complete economic cycle, profits would aggregate substantially the same total, by whichever method computed, the divergences in results from year to year might be considerable.

Methods of Costing Sales

Reviewing very briefly the most generally used methods of costing sales, we find they may be classified as:

(1) The first-in, first-out basis
(2) The last-in, first-out basis
(3) The basis of cumulatively averaged cost.

During periods of rising prices, inventories valued on the basis of "first-in, first-out" will aggregate a larger valuation than on the basis of "last-in, first-out"; conversely, in a period of falling prices, inventories valued on the basis of "first-in, first-out" will aggregate a lower valuation than upon the basis of "last-in, first-out." The basis of cumulatively averaged cost, takes the middle ground between these two bases. These remarks of course are without consideration of market value adjustments. The foregoing indicates that the second and third bases will result in a more conservative operating result than the first method in periods of rising prices. In other words, their effect upon the income accounts is a closer correlation of current sales prices and current purchase costs.

The matter at issue between the "first-in, first-out," and the "last-in, first-out" bases resolves itself into this question:

> Should cost of sales be regarded as meaning
> "previously inventoried cost" or may it mean
> "current reproduction cost"?

To illustrate the different results under these two bases, I cite the example used by the Special Committee on Inventories of the American Institute of Accountants as follows:

> "A wagon maker has a wagon in stock which cost him $50, the selling price of which is $65 to yield him his desired profit of $15 per wagon. Before he sells the wagon he learns from the concern supplying him with his material of a price increase, the result of which is to make the reproduction cost of his wagon $60. By reason of this knowledge the wagon maker 'marks up' his wagon to $75, at which figure he sells it for cash and builds a new wagon costing him $60. The net change resulting from the whole transaction is that his till shows $15 more cash than he had before.
>
> "Now the advocate of 'reproduction cost of sales' says to the wagon maker:
>
> 'The profit you made is $15, and the proper inventory price for the present wagon you have in stock is $50. That is the number

of dollars of your capital invested in your stock-in-trade; the only change that you have effectively realized in that investment is the substitution of one wagon for another exactly like it—the same wagon, in fact, except only as regards physical identity.'

"On the other hand, the advocate of 'first-in, first-out' says to the wagon maker:

'Your profit is $25, although you may have only $15 more in cash to show for it. The other $10 is contained in the increased cost and value of the new wagon—$60 as against the old one at $50. You must not fail to recognize and to give effect to the price level change.'

"Considering the other side of the problem, let us assume that after the above transaction the price level reverted to its original status, thus consummating the economic cycle; accordingly the wagon at present in stock, which actually had cost $60 to build (but was inventoried at either $50 or $60, according to the procedure followed) is sold for $65 and replaced in stock by one which cost $50 to build. Now, under either procedure the latest wagon will be inventoried at $50. The profit on the second transaction, however, will have been $15 according to the 'reproduction cost of sales' advocate, or $5 according to the 'first-in, first-out' advocate. The aggregate profit on the two transactions, of course, will be the same in either case, but the periodic distribution will differ."

Prime Purpose is to Correlate Sales Revenues and Cost of Sales

The Board of Directors of the American Petroleum Institute has indicated that "the prime purpose of the 'last-in, first-out' principle is to bring about in the determination of profits a substantial correlation between sales prices and those raw material prices which have been directly causative of such sales prices." In other words, the purpose is that the revenue from high sales prices be burdened with the high costs which brought about the high sales prices and not leave high-priced inventories to be absorbed in later periods by revenue at a lower price level. It appears to follow that, whereas the principle of "cost or market, whichever is lower" accomplishes a conservative inventory valuation from a short-term viewpoint, the "last-in, first-out" method looks to the longer economic period and the eventual return of low prices after a high price level interim.

The "last-in, first-out" method as enunciated by the American Petroleum Institute does not require the inventory prices to be

reduced to market prices where lower than the regular inventory value, presumably on the assumption that the inventory value adopted at the outset of the "last-in, first-out" method will be so conservative that the price level thus shown in the inventory will be lower than that which ordinary market fluctuations may be expected to reach. It also presumes that those occasions when market prices are below the inventory values are only temporary and unusual conditions from which a prompt recovery is looked for.

Importance of Values Adopted at the Outset

This method places the utmost importance on the inventory values adopted at the inauguration of the "last-in, first-out" method. If the market declines frequently to a value below the inventory value it must be assumed that too high a value was adopted at the outset, as frequent write-downs to market would defeat the prime objective of the "last-in, first-out" method, that is, to correlate sales revenues with the costs causative of the prices reflected by such sales revenue. We would point out also that the "last-in, first-out" method assumes in determining the cost of sales that the goods delivered were those curently purchased.

An Illustration

These principles are shown in an example which I have prepared and are set forth in the exhibits which appear at the end of this article. Let us consider these for a moment. The first three exhibits were prepared as a comparison of valuation upon the "last-in, first-out" basis and the "lower of cost or market" basis.

In Exhibit I the quantities and prices upon which the figures in this example are based are given. Reference to the inventory prices as shown in the right-hand columns indicates that under the "last-in, first-out" method a high valuation of $1.025 per unit was reached at the end of the fifth year, which compares with $1.35 per unit under the "lower of cost or market" basis at the end of the third and fourth years. In respect of the fourth year, a write-down is indicated under the "cost or market," from cost of $1.60 to market of $1.35 per unit.

In Exhibit II the closing inventory valuations have been calculated. Please note that for the first four years the quantity on hand decreased, and accordingly under the "last-in, first-out" method

the unit price of $1.00 remained constant. Compare this with the unit price under the "lower of cost or market" method; in each of the first three years the unit price increased due to rising purchase costs. By reason of the adjustment to market in the fourth year the price held at $1.35 per unit.

With regard to the effect upon the income account as shown in Exhibit III, it will be observed that the profits under the "last-in, first-out" method do not show the extreme fluctuations that they do under the "lower of cost or market" basis, which is entirely by reason of burdening the revenues at high price levels with the costs which cause the high prices; or, in other words, a determination of closing inventory values upon a "replacement cost basis."

Contrasted with "Base Stock" Method

The "last-in, first-out" principle has been likened to the "base stock" or "base inventory" method of valuation, the purpose of which likewise is to assure that the revenue produced from high sales prices is burdened with the costs which cause the high sales prices. The "base stock" method, however, approaches the problem by way of ascertaining a "normal" inventory stock and the "low price level" at which the stock is to be valued. If you will kindly refer to Exhibit IV you will find the "year-to-date" method adopted by the American Petroleum Institute. You will note that the quantity is basic for a one-year period only and that the inventory price is adjusted by averaging (1) the excess of the production and purchases over the sales volume, and (2) the volume on hand at the beginning of the year. Thus it is seen that in those years in which the quantity increases a new basic volume and price adheres. This differs from the "base inventory method," as that method maintains a "normal" inventory stock and price for a longer period than one year.

Answer to Criticisms

Certain criticisms have been directed toward the "last-in, first-out" method of valuation. For instance, it has been remarked that during periods of declining market prices the inventories are overstated in the balance sheet, and that the profits are likewise overstated under this method. To provide for such contingency the American Petroleum Institute Committee has provided that

"where the market value of the inventory is less than that carried in the balance sheet, such condition should be shown in parentheses or as a footnote in such manner that the approximate difference can be ascertained either in dollars or percentage." As pointed out before, upon the inauguration of the "last-in, first-out" method, an inventory valuation should be adopted which will be lower than that which ordinary market fluctuations may be expected to reach.

Also, it has been said that this method does not follow the physical movement of the products. To some extent that is true, but in a large measure the physical movement of production in the petroleum industry is from the well to the refineries. Reserve stocks, of course, are utilized to whatever extent is required. In the earlier days business structures were simpler, whereas the more complex business relations and situations of today render identification of products and "identifiable costs" almost impossible and have caused nearly every large industry to resort to an arbitrary allocation.

It has been said that the valuation of the residual inventory has not been dealt with beyond requiring it to be at a "conservative or reasonable figure" and that consequently the valuation of the inventory as it appears in the financial statements of the various oil companies will reflect the particular valuation price level which each company may regard as "conservative or reasonable." It does not appear to me that this condition differs from the present situation with regard to the various companies in any industry. I remarked earlier with regard to the different interpretations of costs, and although I did not dwell upon the interpretations which might be placed on market value, it is my experience that the range of conceptions thereof is equally wide.

Conclusions of the Special Committee

After a complete review of the subject matter pertaining to the "last-in, first-out" method of valuation and joint deliberation with the Sub-Committee of the American Petroleum Institute, the Special Committee on Inventories of the American Institute of Accountants summed up their conclusion as follows:

> "The 'last-in, first-out' method for the valuation of oil company inventories as recommended by the American Petroleum Institute constitutes an *acceptable accounting principle for those companies*

which, finding it adaptable to their needs and views as correctly reflecting their income, apply it consistently from year to year; it is important, however, that full and clear disclosure in their published financial statements be made by the companies adopting it, both as to the fact of its adoption and the manner of its application, including information as to the period adopted for the unit of time within which the goods last in are to be deemed first out, that is, whether the fiscal year or a shorter or longer period.

"Since the method as outlined by the Committee of the American Petroleum Institute requires that the valuation to be placed upon the inventory be 'conservative or reasonable' without, however, providing for a uniform standard or common basis in the determination of such valuations, it must be understood by readers of the financial statements of companies adopting the method that the inventory valuation of one such company is not to be regarded as comparable with that of another, except only in so far as the current replacement valuation arrived at under the method affords such a comparison.

"The foregoing conclusion of our Committee, however, does not preclude our viewing other methods as being either equally acceptable or preferable in the case of other companies where different conditions may prevail."

Conclusion

The main point in this opinion would appear to be the matter of *consistent application* from year to year. Most accountants and business men recognize consistency and conservatism as paramount in good business. It occurs to me that the "cost hypothesis" which I have described, acting as a leveler of the peaks and valleys of industry's profits and losses, should recommend itself to the consideration of prudent management. We have just passed through the period from 1929 and witnessed the ills of boom profits followed by tremendous losses or meager profits. It would seem that a policy or method which would, at the least, alleviate a recurrence thereof should receive our earnest consideration. It is recognized that the "last-in, first-out" valuation method is not a panacea for business ills. It requires sound judgment in management and consistency of application, as do all valuation methods. It may have been reborn of the depression, but it is distinctly not new, and with relation to the petroleum industry was inaugurated during a low price era. It looks to the longer economic period—the return of normalcy after periods of fluctuating prices and operations. It is recommended for your consideration.

EXHIBIT I

QUANTITIES AND PRICES ON WHICH FIGURES ARE BASED

	Units	Price	Inventory Price Last-in, first-out	Inventory Price Cost/Market
First Year:				
Opening Inventory	1,000,000	$1.00	$1.00	$1.00
Sales	1,500,000	1.25		
Purchases	1,450,000	1.10		
Closing Inventory	950,000		1.00	1.10
Second Year:				
Sales	1,700,000	1.25		
Purchases	1,600,000	1.15		
Closing Inventory	850,000		1.00	1.15
Third Year:				
Sales	1,600,000	1.50		
Purchases	1,500,000	1.35		
Closing Inventory	750,000		1.00	1.35
Fourth Year:				
Sales	1,300,000	1.75		
Purchases	1,250,000	1.60		
Closing Inventory	700,000		1.00	1.35*
Fifth Year:				
Sales	1,100,000	1.35		
Purchases	1,200,000	1.20		
Closing Inventory	800,000		1.025	1.20*
Sixth Year:				
Sales	1,150,000	1.20		
Purchases	1,450,000	1.00		
Closing Inventory	1,100,000		1.0182	1.00
Seventh Year:				
Sales	1,650,000	1.10		
Purchases	1,750,000	.90		
Closing Inventory	1,200,000		1.0083	.90
Eighth Year:				
Sales	2,050,000	1.00		
Purchases	2,100,000	.80		
Closing Inventory	1,250,000		1.00	.80
Ninth Year:				
Sales	2,150,000	.95		
Purchases	2,000,000	.80		
Closing Inventory	1,100,000		1.00	.80
Tenth Year:				
Sales	1,800,000	1.15		
Purchases	1,700,000	1.00		
Closing Inventory	1,000,000		1.00	1.00

* Market.

EXHIBIT II

CLOSING INVENTORIES

	Last-In, First-Out Basis—A. P. I. Method			Lower of Cost or Market Basis			Inventory Increase (+) or Decrease (—)	
	Units	Price	Amount	Units	Price	Amount	Normal	Lower of Cost (+) or Market (—)
First Year	950,000	$1.00	$ 950,000	950,000	$1.10	$1,045,000	$ 50,000—	$ 45,000+
Second Year	850,000	1.00	850,000	850,000	1.15	977,500	100,000—	67,500—
Third Year	750,000	1.00	750,000	750,000	1.35	1,012,500	100,000—	35,000+
Fourth Year	700,000	1.00	700,000	700,000	1.35*	945,000	50,000—	67,500—
Fifth Year	700,000	1.00	700,000	800,000	1.20*	960,000	0	0
	100,000	1.20	120,000	0	0	0		
	800,000	$1.025	$ 820,000	800,000	$1.20	$ 960,000	120,000+	15,000+
Sixth Year	800,000	$1.025	$ 820,000	1,100,000	$1.00	$1,100,000		
	300,000	1.00	300,000					
	1,100,000	$1.0182	$1,120,000	1,100,000	$1.00	$1,100,000	300,000+	140,000+
Seventh Year	1,100,000	$1.0182	$1,120,000	1,200,000	$ .90	$1,080,000		
	100,000	.90	90,000					
	1,200,000	$1.0083	$1,210,000	1,200,000	$ .90	$1,080,000	90,000+	20,000—
Eighth Year	1,200,000	$1.0083	$1,210,000	1,250,000	$ .80	$1,000,000		
	50,000	.80	40,000					
	1,250,000	$1.00	$1,250,000	1,250,000	$ .80	$1,000,000	40,000+	80,000—
Ninth Year	1,100,000	$1.00	$1,100,000	1,100,000	$ .80	$ 880,000	150,000—	120,000—
Tenth Year	1,000,000	1.00	1,000,000	1,000,000	1.00	1,000,000	100,000—	120,000+

* Market.

EXHIBIT III

PROFIT AND LOSS STATEMENT

Last-In, First-Out Basis—A. P. I. Method:	*First Year*	*Second Year*	*Third Year*	*Fourth Year*	*Fifth Year*	*Sixth Year*	*Seventh Year*	*Eighth Year*	*Ninth Year*	*Tenth Year*	*Total*
Sales	$1,875,000	$2,125,000	$2,400,000	$2,275,000	$1,485,000	$1,380,000	$1,815,000	$2,050,000	$2,042,500	$2,070,000	
Cost of Sales:											
Opening Inventory	$1,000,000	$ 950,000	$ 850,000	$ 750,000	$ 700,000	$ 820,000	$1,120,000	$1,210,000	$1,250,000	$1,100,000	
Purchases	1,595,000	1,840,000	2,025,000	2,000,000	1,440,000	1,450,000	1,575,000	1,680,000	1,600,000	1,700,000	
	$2,595,000	$2,790,000	$2,875,000	$2,750,000	$2,140,000	$2,270,000	$2,695,000	$2,890,000	$2,850,000	$2,800,000	
Less — Closing Inventory	950,000	850,000	750,000	700,000	820,000	1,120,000	1,210,000	1,250,000	1,100,000	1,000,000	
Total Cost of Sales	$1,645,000	$1,940,000	$2,125,000	$2,050,000	$1,320,000	$1,150,000	$1,485,000	$1,640,000	$1,750,000	$1,800,000	
Profit	$ 230,000	$ 185,000	$ 275,000	$ 225,000	$ 165,000	$ 230,000	$ 330,000	$ 410,000	$ 292,500	$ 270,000	$2,612,500
Lower of Cost or Market Basis:											
Sales	$1,875,000	$2,125,000	$2,400,000	$2,275,000	$1,485,000	$1,380,000	$1,815,000	$2,050,000	$2,042,500	$2,070,000	
Cost of Sales:											
Opening Inventory	$1,000,000	$1,045,000	$ 977,500	$1,012,500	$ 945,000	$ 960,000	$1,100,000	$1,080,000	$1,000,000	$ 880,000	
Purchases	1,595,000	1,840,000	2,025,000	2,000,000	1,440,000	1,450,000	1,575,000	1,680,000	1,600,000	1,700,000	
	$2,595,000	$2,885,000	$3,002,500	$3,012,500	$2,385,000	$2,410,000	$2,675,000	$2,760,000	$2,600,000	$2,580,000	
Less — Closing Inventory	1,045,000	977,500	1,012,500	945,000	960,000	1,100,000	1,080,000	1,000,000	880,000	1,000,000	
Total Cost of Sales	$1,550,000	$1,907,500	$1,990,000	$2,067,500	$1,425,000	$1,310,000	$1,595,000	$1,760,000	$1,720,000	$1,580,000	
Profit	$ 325,000	$ 217,500	$ 410,000	$ 207,500	$ 60,000	$ 70,000	$ 220,000	$ 290,000	$ 322,500	$ 490,000	$2,612,500

EXHIBIT IV

EXAMPLE OF THE "LAST-IN, FIRST-OUT" UNIFORM METHOD OF VALUING PETROLEUM INVENTORIES

(When applied on a year-to-date basis) Approved by the American Petroleum Institute, Nov. 12, 1934

1936	*Opening Inventory*	*Production or Purchases*	*Cost of Sales*	*Closing Inventory*
1. January	100 @ 10¢	200 @ 9¢	150 @ 9¢	100 @ 10¢ 50 @ 9¢
2. February	100 @ 10¢ 50 @ 9¢	200 @ 8¢	175 @ 8.07¢	
3. 2 Months		400 @ 8.5¢	325 @ 8.5¢	100 @ 10¢ 75 @ 8.5¢
4. March	100 @ 10¢ 75 @ 8.5¢	175 @ 7¢	275 @ 7.681¢	
5. 3 Months		575 @ 8.043¢	575 @ 8.043¢ } Avg. 25 @ 10¢ } 8.125¢	75 @ 10¢
6 April	75 @ 10¢	225 @ 7.5¢	175 @ 7.086¢	100 @ 10¢
7. 4 Months		800 @ 7.890¢	775 @ 7.890¢	25 @ 7.890¢
8. May	100 @ 10¢ 25 @ 7.890¢	220 @ 9¢	240 @ 8.904¢	
9. 5 Months		1,020 @ 8.130¢	1,015 @ 8.130¢	100 @ 10¢ 5 @ 8.130¢
10. June	100 @ 10¢ 5 @ 8.130¢	215 @ 10.5¢	230 @ 10.426¢	
11. 6 Months		1,235 @ 8.543¢	1,235 @ 8.543¢ } Avg. 10 @ 10¢ } 8.554¢	90 @ 10¢
12. July	90 @ 10¢	205 @ 11.5¢	225 @ 11.369¢	
13. 7 Months		1,440 @ 8.964¢	1,440 @ 8.964¢ } Avg. 30 @ 10¢ } 8.985¢	70 @ 10¢
14. August	70 @ 10¢	210 @ 12.5¢	200 @ 12.625¢	
15. 8 Months		1,650 @ 9.414¢	1,650 @ 9.414¢ } Avg. 20 @ 10¢ } 9.412¢	80 @ 10¢
16. September	80 @ 10¢	230 @ 13.5¢	215 @ 13.744¢	
17. 9 Months		1,880 @ 9.914¢	1,880 @ 9.914¢ } Avg. 5 @ 10¢ } 9.914¢	95 @ 10¢
18. October	95 @ 10¢	235 @ 13¢	230 @ 13.065¢	
19. 10 Months		2,115 @ 10.257¢	2,115 @ 10.257¢	100 @ 10¢
20. November	100 @ 10¢	240 @ 12.5¢	235 @ 12.545¢	
21. 11 Months		2,355 @ 10.485¢	2,350 @ 10.485¢	100 @ 10¢ 5 @ 10.485¢
22. December	100 @ 10¢ 5 @ 10.485¢	250 @ 11.5¢	240 @ 11.533¢	
23. 12 Months		2,605 @ 10.583¢	2,590 @ 10.583¢	100 @ 10¢ } Avg. 15 @ 10.583¢ } 10.076¢
1937 (New Opening Inventory) January	115 @ 10.076¢			

BIBLIOGRAPHY

NORMAL STOCK AND LAST-IN, FIRST-OUT METHODS OF INVENTORY VALUATION

N. A. C. A. Publications:

Normal Stock Method of Inventory Valuation. H. T. Warshow. 1922 Year Book.

Present-Day Problems of Inventory Valuation. Maurice E. Peloubet. 1936 Year Book.

General:

Base Stock Principle in Income Accounting. Ross G. Walker. Harvard Business Review, Fall, 1936.

Inventory Control, Including the Valuation of Basic Stocks at Normal Prices. Jaroslav Fukatko. Proceedings, International Congress of Accounting, 1929.

Normal Stock Method of Valuing Inventories, The. William F. Burke. Factory Management and Maintenance, July, 1934.

Oil Inventories Accounting. H. S. Thompson. Journal of Accountancy, January, 1936.

Principles of Inventory Valuation. Maurice E. Peloubet. New York Certified Public Accountant, April, 1935.

Valuation of Inventories; Report by Special Committee on Inventories. Journal of Accountancy, August, 1936.

Valuation of Normal Stocks at Fixed Prices. Maurice E. Peloubet. Proceedings, International Congress on Accounting, 1929.

Virginia is often a girl's name,
It is also the name of a state.
Hot Springs is the pride of Virginia;
Its history we've tried to relate.

The attractions of Hot Springs are many,
This month we are mentioning one,
And if you attend the Convention
You're assured of some wonderful fun.

Just turn to the page in this issue
Where Golf at Hot Springs is described,
'Tis but one of the many attractions
Which later will be amplified.

Here's a chance to combine a vacation
And a stay at a wondrous resort
With a round of fine technical sessions
And meetings with men of your sort.

Start now to make your arrangements
To attend this important event,
Be assured you'll enjoy every moment
And feel that your time was well spent.